UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/785,194	02/25/2004	Yoshihiro Tsukuda	914-178	3361

23117 7590 06/17/2004

NIXON & VANDERHYE, PC
1100 N GLEBE ROAD
8TH FLOOR
ARLINGTON, VA 22201-4714

EXAMINER	
DIAMOND, ALAN D	

ART UNIT	PAPER NUMBER
1753	

DATE MAILED: 06/17/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/785,194	TSUKUDA ET AL.	
	Examiner	Art Unit	
	Alan Diamond	1753	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *25 February 2004*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1,3,7 and 9* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1,3,7 and 9* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *25 February 2004* is/are: a)☐ accepted or b)☒ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☒ Certified copies of the priority documents have been received in Application No. 09/723,278.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date *02252004*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Drawings

1. The drawings are objected to as failing to comply with 37 CFR 1.84(p)(5) because they include the following reference character(s) not mentioned in the description: reference sign 5 in Figure 2. Corrected drawing sheets, or amendment to the specification to add the reference character(s) in the description, are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The replacement sheet(s) should be labeled "Replacement Sheet" in the page header (as per 37 CFR 1.84(c)) so as not to obstruct any portion of the drawing figures. If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

Claim Rejections - 35 USC § 102

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.
>
> (e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

3. Claims 1, 3, 7, and 9 are rejected under 35 U.S.C. 102(e) as being anticipated by Yoshida et al, U.S. Patent 6,413,313

The applied reference has a common inventor with the instant application. Based upon the earlier effective U.S. filing date of the reference, it constitutes prior art under 35 U.S.C. 102(e). This rejection under 35 U.S.C. 102(e) might be overcome either by a showing under 37 CFR 1.132 that any invention disclosed but not claimed in the reference was derived from the inventor of this application and is thus not the invention "by another," or by an appropriate showing under 37 CFR 1.131.

Yoshida et al prepares a polycrystalline silicon sheet, wherein a base plate (8) having protruding dots (41) is cooled and immersed in melt (S1), forming crystals of silicon on the dots (see col. 3, lines 6-11; col. 5, line 1 through col. 6, line 28; and Figures 1 and 3). The dots can be formed from silicon carbide, as per instant claim 7. Crystal growth starts at the dots (see col. 3, lines 6-11). Since Yoshida et al teaches the limitations of the instant claims, the reference is deemed to be anticipatory.

The Examiner acknowledges that the certified English translation of the instant Japanese foreign priority document having a filing date of November 30, 1999 is of record in parent Serial No. 10/323,666. However, it is the Examiner's position that instant claims 1, 3, 7, and 9 rejected over Yoshida et al are not fully supported by said certified English translation. The following is not supported by said certified English translation:

In instant independent claim 1 and its dependent claims, a generic "base" that has the protrusions is not supported by said certified English translation. Said certified

English translation has support for a "roller" which has the protrusions. However, a "roller" is not sufficient support for the generic term "base".

In instant independent claim 1 and its dependent claims, a generic "semiconductor material" is not supported by said certified English translation. Said certified English translation discloses silicon. However, "silicon" is not sufficient support for all semiconductor materials.

In instant claim 3, the language "at least one of" with respect to the dot protrusions and linear protrusions is not supported by said certified English translation. Said "at least one of" language encompasses the situation where both dot protrusions and linear protrusions are present at the same time. This situation is not supported by said certified English translation. Said certified English translation only has support for dot protrusions "or" linear protrusions.

In claim 7, the boron nitride, silicon nitride, and pyrolitic carbon for the coating material on the protrusions are not supported by said certified English translation.

4. Claims 1, 3, and 9 are rejected under 35 U.S.C. 102(b) as being anticipated by Wakefield et al, U.S. Patent 4,688,623.

Wakefield et al '623 teaches a method of manufacturing a silicon ribbon, wherein a roller (38) with protrusions (54,66) on its peripheral surface is dipped into molten silicon (32), and crystals are formed on said protrusions (see also Figures 1, 2, 4, and 5; and col. 2, line 21 through col. 4, line 50). Said protrusions are cooled, and Wakefield et al '623 teaches that the textured surface of said roller (38) establishes a plurality of crystal nucleation cites with controlled heat extraction (see the paragraph bridging cols.

2 and 3). The protrusions can be linear or dot (see Figures 3-5). Since Wakefield et al '623 teaches the limitations of the instant claims, the reference is deemed to be anticipatory.

Claim Rejections - 35 USC § 103

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

6. Claims 1, 3, 7, and 9 are rejected under 35 U.S.C. 103(a) as being unpatentable over Wakefield et al, U.S. Patent 4,688,623 in view of JP 10-29895, here referred to as JP '895, and JP 59-78920, herein referred to as JP '920

Wakefield et al '623 teaches a method of manufacturing a silicon ribbon, wherein a roller (38) with protrusions (54,66) on its peripheral surface is dipped into molten silicon (32), and crystals are formed on said protrusions (see also Figures 1, 2, 4, and 5; and col. 2, line 21 through col. 4, line 50). Said protrusions are cooled, and Wakefield et al '623 teaches that the textured surface of said roller (38) establishes a plurality of crystal nucleation cites with controlled heat extraction (see the paragraph bridging cols. 2 and 3). The protrusions can be linear or dot (see Figures 3-5). Wakefield '623 teaches the limitations of the instant claims other than the difference which is discussed below.

Wakefield et al '623 does not specifically teach that its protrusions on the surface of the roller are coated with, for example, silicon carbide (SiC) or silicon nitride (SiN).

JP '895 teaches the preparation of silicon ribbon, wherein its roller has a SiN coating, so as to provide heat resistance to the roller (see paragraphs 0006 and 0013). JP '895 teaches that its roller's surface need not be flat, and can have U- and V-shaped features (see paragraph 0030). JP '920 prepares silicon ribbon, wherein its roller is coated with SiC to help reduce damage to the roller (see the attached English abstract; and the entire JP '920 document). It would have been obvious to one of ordinary skill in the art at the time the invention was made to have provided Wakefield et al '623's roller, including the protrusions, with a coating of SiN or SiC so as to protect the roller, as taught by JP '895 and JP '920.

Double Patenting

7. The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the "right to exclude" granted by a patent and to prevent possible harassment by multiple assignees. See *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970);and, *In re Thorington,* 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent is shown to be commonly owned with this application. See 37 CFR 1.130(b).

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

8. Claims 1, 3, 7, and 9 are rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 1-10 of U.S. Patent No. 6,596,075. Although the conflicting claims are not identical, they are not

patentably distinct from each other because the cooling plate in the claims of said patent can have protrusions (see claims 5 and 6, and figures 20-24).

9. Claims 1, 3, 7, and 9 are provisionally rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 2, 4, 8, 10, 13, 16-21,23, and 24 of copending Application No. 10/323,666. Although the conflicting claims are not identical, they are not patentably distinct from each other because the silicon in the claims of said copending application is a species of the instant semiconductor material.

This is a provisional obviousness-type double patenting rejection because the conflicting claims have not in fact been patented.

Conclusion

10. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. US 6,521,827 and US 2003/0111105 are hereby made of record.

11. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Alan Diamond whose telephone number is 571-272-1338. The examiner can normally be reached on Monday through Friday, 5:30 a.m. to 2:00 p.m. ET.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Nam Nguyen can be reached on 571-272-1342. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for

published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Alan Diamond
Primary Examiner
Art Unit 1753

Alan Diamond
June 14, 2004